

possess such firmness that they can be cut through horizontally with a sharp knife and nevertheless remain in their position. The larger of them are frequently flattened, but I could not find a trace of membranes by which they might be retained so firmly in their position. Similar solid filaments are met with in the larger cells of the fruit-parenchyma of *Ribes nigrum*: in this case also the upper and lower side of the cell may be cut away without the filaments running through their centre being moved out of their position.

II.—*List of the Birds observed to winter in Macedonia; from Notes made by Capt. H. M. DRUMMOND, 42nd R. H., during a two months' Shooting Excursion in the Interior during the winter of 1845-46.*

I AM not aware if Macedonia has ever been fully explored by any naturalist with a view to its ornithology, but from the general appearance of the country, its rich and varied landscape, abounding in high mountains as well as extensive plains, in some parts richly cultivated, in others clothed with vast extents of forest intersected by numerous lakes, rivers and marshes, as also from its geographical position, being so directly in the line of migration of all those species which pass up the Archipelago, it becomes one of the most interesting fields to the ornithologist, and I have no doubt, were it visited also during the spring and summer months, it would be found to possess many rare and beautiful species, and some even new to the European fauna.

Vultur cinereus. A few of these rare and magnificent birds were seen in the large wooded plains, generally perched on the naked limb of some dead tree, where they sit for hours, seeming to prefer perfect solitude, never mixing with the other vultures; they were never observed on the mountains, but probably regulate their movements according to the herds of cattle which at this season are all brought down to the low grounds.

V. fulvus. Most numerous on the plains as well as the mountains.

Cathartes percnopterus. } A few seen on the mountains.
Gypaëtus barbatus. }

Falco peregrinus. }
F. subbuteo. } Common.
F. æsalon. }
F. tinnunculus. }
F. imperialis. Rare.

F. fulvus. } Most numerous on the large wooded plains, fifteen
F. albicilla. } or twenty being often observed in the air at once,
 and their nests may be seen in every direction, the largest trees being

generally selected for the purpose. On the 1st of January I observed a pair of golden eagles; the female was on her eyry, while the male was busily employed breaking off branches from the tree: as they always roost in their eyries, they were probably repairing it, having most likely suffered from a heavy gale of wind the day before.

Falco brachydactylus. Not uncommon.

F. leucocephalus. Common, and generally observed in the marshes or those parts of the plains free from wood; solitary, and commonly seen sitting on the ground or perched on any slight eminence, where they keep so good a look-out that it is difficult to approach within shot.

F. palumbarius. One was shot in the act of devouring a rook which he had just killed.

F. nisus. Common.

F. milvus. Most numerous, and seem fond of society, as they roost in company; upwards of fifty of these birds were seen one evening about sunset, sitting upon one tree along with a *F. brachydactylus*.

F. buteo. Very common.

F. lagopus. One seen.

F. cyaneus.

F. rufus.

Strix bubo.

S. otus.

S. passerina.

} Very common in the marshes.

} Common.

Corvus corax. Common.

C. corone. Not so common as the above.

C. cornix. Most numerous.

C. frugilegus. Though most numerous at this season, no rookery was ever observed in any part of the country, nor could I ascertain whether they were known to breed; therefore probably they are of regular passage as at Corfu.

C. collaris (mihi). This bird, though strongly resembling the *C. monedula*, yet on close examination differs so materially that I have ventured to consider it as an entirely distinct species. The ring jackdaw is about the same size as the common jackdaw, but differs in having the hinder part of the head of a light silvery gray, and a large white crescented patch on each side of the neck, the whole of the back and upper tail-covers dusky and shaded with ash; throat black, the whole of the lower parts lead-colour, each feather darker in the centre, the ring on the female not quite so conspicuous as in the male: these birds are most numerous in all the towns and villages of Macedonia; they were also seen in great numbers in Thessaly, and in one instance only in Albania. The *C. monedula* was never observed.

Garrulus pica. Most numerous, and may be seen every evening in long strings repairing to the reeds on the banks of the Vardar and Karrasmak, where, along with the starlings, they roost in myriads.

G. glandarius. I was unfortunately unable to procure a specimen of these birds while in Macedonia; though common, they were so

excessively shy, that I was prevented from ascertaining whether they differed from the common jay of England ; but as I afterwards procured several specimens both in Thessaly and Albania, which were the common *G. glandarius*, I have no doubt that those in Macedonia were the same.

Sturnus vulgaris. Most numerous.

Lanius excubitor. Rare.

Turdus viscivorus. A few seen.

T. pilaris. Common.

T. musicus. Very common.

T. iliacus. A few seen.

T. merula. Very common.

Sylvia rubecula. Very common.

S. hippolais. Common.

Regulus cristatus. } Common.

R. ignicapillus. }

Troglodytes vulgaris. Very common.

Saxicola rubicola. Very common.

Accentor modularis. Not uncommon. This is the first time I have observed this bird (so numerous in England) in the south of Europe.

Motacilla alba. } Common.

M. flava. }

Anthus pratensis. Very common.

Alauda arvensis. Most numerous, and seen in immense flocks.

A. cristata. Very common ; generally seen in small trips of five or six birds frequenting the roads and horse-paths.

A. calandra. Common on the plains and seen in flocks of about twenty.

Parus major. } Common.

P. cæruleus. }

P. palustris. }

P. caudatus. }

Emberiza citrinella. Seen only on the mountains at about 3000 feet above the level of the sea, where they were pretty numerous : this is the first instance of my having met with this bird in the south of Europe.

E. miliaria. Very common.

E. schæniculus. } Common.

E. cirrus. }

E. cia *.

Pyrrhula vulgaris. } Common.

Fringilla coccothraustes. }

F. chloris. }

F. domestica. }

F. montana. A few seen. It is worthy of notice, that in travelling through Bulgaria and part of Servia in the summer of 1836, I in no one instance met with the *F. domestica*, but found it completely replaced by the *F. montana*, which abounded in all the towns and

* This bird was not mentioned as an inhabitant of Corfu, but I have since met with it in considerable numbers during the winter.

villages, breeding under the eaves of the houses, and on the 13th of June I took their eggs from the thatch of a cottage near Negotin in Servia; I also observed them to have the same habits in some parts of Hungary. The roller and bee-eater I also found in great numbers, breeding in company on the banks of the Danube near Rudschuk in Bulgaria, on the 8th of June: they form their nests in holes on the perpendicular banks like the sand martin, and invariably occupied the same places.

Fringilla caelebs. Most numerous, and found high up on the mountains as well as the plains.

F. montifringilla. A few seen.

F. cannabina. Common.

F. carduelis. Very common.

Picus viridis.

P. major.

P. medius.

} Very common, especially the latter.

P. minor. Not so common as the above-mentioned.

Sitta europæa. One or two seen.

Certhia familiaris. This seems to be a rare bird here, as one individual only was observed.

Alcedo ispida. Common.

Columba palumbus. Common.

C. ænas. Very numerous and seen in large flocks.

C. livia. Not nearly so common as the above.

C. —. A pair of these birds were seen flying about in a village near Berea or Varea (as it is now pronounced), and were apparently in a wild state. Not having seen Mr. Gould's valuable work on the 'Birds of Europe,' I know not whether he has included the collared or Barbary turtle in the European fauna; it is however deserving of a place, as I observed them in all the towns and villages in Bulgaria; I also noticed them at Constantinople in the months of May and June, when they were abundant, breeding in the cypresses in the extensive cemeteries of Scutari and Pera. Capt. Kinloch, late of the 42nd, informed me that they were abundant in Rhodes, and that he had also found their nests in the cypress trees*.

Phasianus colchicus. Very abundant, frequenting the dry reeds and osier beds in the vicinity of the rivers and marshes: found only on the plains, not known on the mountains.

Perdix francolinus. I never observed this bird myself, but on the authority of one of the peasants, an intelligent man, who gave me so exact a description of the bird, I have ventured to give it a place in this catalogue; he informed me that they were rare, but that he had shot them in the long grass near the sea.

* As Capt. Drummond gives no description of this bird, it is uncertain whether he here refers to the *Turtur senegalensis* (*cambayensis*, *ægyptiaca* and *maculicollis* of authors), first noticed as a European species by myself (Proc. Zool. Soc. 1836, p. 100), and since found abundantly in Greece by Von der Mühle (Ornithologie Griechenlands, p. 83); or to the *Turtur risorius*, a species common in North Africa, and once met with by Naumann on the Balcan (Wieg. Archiv, 1837, p. 106).—H. E. STRICKLAND.

Perdix saxatilis. Very common, but found only on the mountains.

P. cinerea. Very common in the plains, but were never observed on the mountains.

P. coturnix. Common.

Otis tarda. Very common, generally frequenting the marshy plains; they were also observed feeding in immense flocks in the plains of Meteora in Thessaly: the call of the male bird is of the most extraordinary kind; it is very loud, and resembled something between the cackling of geese, the croaking of frogs, and the harsh grating of a rusty hinge. May not the pouch with which the male bird is furnished have something to do with this extraordinary cry, as I believe it is not ascertained to what purpose it is applied?

Charadrius hiaticula. A few seen.

Vanellus cristatus. Common.

Grus leucogeranus. A large flock of these very rare birds were seen on the 9th of January; when on the wing they made a hissing noise; I unfortunately was unable to obtain a specimen.

G. cinerea. Very common, and were generally seen in parties of three to five.

Ciconia alba. Very common at this season of the year; they were chiefly found in the open country, not frequenting the towns or villages, but from the quantities of their nests on the house-tops, they must be very abundant in the breeding season.

Ardea cinerea.
A. egretta.
A. egrettoïdes. } Very common.

Avocetta recurvirostra. One seen on the 1st of January.

Numenius arquatus. Common.

Tringa variabilis. A few seen.

Totanus calidris. Common.

T. hypoleucos. A few seen.

Limosa melanura. Very common.

Scolopax rusticola. Most abundant.

S. gallinago.
S. gallinula. } Not very numerous.

Rallus aquaticus. Common.

Fulica atra. Very numerous.

Podiceps cristatus.
P. auritus. } Common.

P. minor.

Larus argentatus.
L. canus. } Common.

L. melanocephalus.

Puffinus cinereus. A few seen in the bay of Salonica.

Anser hyperboreus. A large flock of these very rare birds were seen on the 20th of January; when on the wing they were perfectly silent.

A. ferus.
A. segetum. } Very numerous.
A. albifrons. A few seen.

Anser ruficollis. Only one of these very rare birds was observed.

Cygnus musicus. Very common.

Anas tadorna.

A. boschas.

A. strepera.

A. acuta.

A. penelope.

A. crecca.

A. clypeata.

A. nyroca.

A. ferina.

A. clangula.

Common. Wild fowl are most abundant throughout Macedonia, and had I made a longer stay in the country, no doubt many other species would have been observed besides those mentioned.

Mergus serrator. Common.

M. albellus. Very numerous, though none but females were observed; the same remark applies to the Ionian Islands. Might not some of these supposed females have been males, not having assumed the breeding plumage?

Pelecanus onocrotalus. Very common.

Carbo cormoranus. } Common.

C. graculus.

C. pygmaeus. Most numerous.

III.—Observations on the Cell-Membrane of Plants.

By G. H. K. THWAITES*.

If a decaying vegetable organism is brought before us, in which nothing remains of the former structure but the cell-walls, it is difficult to conceive that this skeleton, as it were, has performed an important part in the vital processes of the plant,—that it has been an agent in the chemical changes which had been going on during the processes of secretion, assimilation, &c.,—in fact, that it has been any other than a mere skeleton for the support of the important parts of the organism: I say that, divesting the mind of preconceived notions respecting the functions of cell-membrane, it is difficult to regard it, under such circumstances, otherwise than in the light I have just mentioned. I hope to be able to show that this is really the view which should be taken of it.

To prevent any misconception of my meaning, I will just state that when using the term "*endochrome*" in the succeeding part of my paper, I wish it to be considered as comprising the entire contents of the cell, including the nucleus or nuclei. The terms *cell-membrane* or *cell-wall* explain themselves.

There cannot be a more satisfactory way of showing the subordinate character of the cell-membrane than by exhibiting a perfect living organism in which it does not exist, and there are

* Being the substance of a paper read at a Meeting of the Bristol Microscopical Society, April 8, 1846.